Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A composite article to serve as a flexible, durable, light-weight insulation product comprising
an aerogel monolith containing ~~and a reinforcing structure to serve as a flexible, durable, light-weight insulation product wherein the reinforcing structure comprises~~ a lofty fibrous batting as a reinforcement within the monolith ~~which causes no substantial degradation of the thermal performance of the aerogel as compared with a non-reinforced aerogel body of the same material and the aerogel monolith is not formed by joining together of aerogel particles or granules in a binder~~.

2. (Original) The composite of claim 1, wherein the aerogel is selected from the group consisting of inorganic and organic gel forming materials.

3. (Original) The composite of claim 1, wherein the inorganic gel forming material is selected from the group consisting of zirconia, yttria, hafnia, alumina, titania, ceria, and silica, and any combination thereof.

4. (Original) The composite of claim 1, wherein the organic gel forming material is selected from the group consisting of polyacrylates, polystyrenes, polyacrylonitriles, polyurethanes, polyimides, polyfurfural alcohol, phenol furfuryl alcohol, melamine formaldehydes, resorcinol formaldehydes, cresol formaldehyde, phenol formaldehyde, polyvinyl alcohol dialdehyde, polycyanurates, polyacrylamides, various epoxies, agar, and agarose, and combination thereof.

5. (Original) The composite of claim 1, wherein the lofty fibrous batting consists essentially of fibers having a thermal conductivity less than 50 mW/m-K.

6. (Original) The composite of claim 1, wherein the lofty batting has a sufficient quantity of fibers in its z axis to provide loft yet not so many that the insulating properties of the composite are compromised by the z axis fibers acting as thermal conduits.

7. (Currently amended) The composite of claim 1, further comprising a finely dispersed dopant in an amount sufficient to improve the composite's thermal performance at high temperatures ~~of the composite~~.

8. (Original) The composite of claim 7, wherein the dopant is selected from the group consisting of carbon black, titania, iron oxides, silicon carbide, molybdenum silicide, manganese oxides, and polydialkylsiloxanes wherein the alkyl groups contain 1 to 4 carbon atoms.

9. (Original) The composite of claim 7, wherein the dopant is present in an amount of about 1 to 20% by weight of the total weight of the composite.

10. (Previously presented) The composite of claim 1, wherein the surface area of the fibers of the batting visible in a cross-section of the composite is less than 8% of the total surface area of that cross section.

11. (Original) The composite of claim 1, wherein the fibers making up the lofty fibrous batting have a diameter of about 0.1 to 100 μm and are crimped fibers evenly dispersed throughout the composite.

12. (Currently amended) A composite article comprising an aerogel monolith and a reinforcing structure to serve as a flexible, durable, light-weight insulation product wherein the reinforcing structure comprises a fibrous batting which is sufficiently lofty that the cross-sectional area of the fibers of the batting visible in a cross-section of the composite is less than less than 10% of the total surface area of that cross section ~~and the aerogel monolith is not formed by joining together of aerogel particles or granules in a binder~~.

13. (Original) The composite of claim 12, wherein the aerogel is selected from the group consisting of inorganic and organic gel forming materials.

14. (Original) The composite of claim 12, wherein the inorganic gel forming material is selected from the group consisting of zirconia, yttria, hafnia, alumina, titania, ceria, and silica, and any combination thereof.

15. (Original) The composite of claim 12, wherein the batting is compressible by a minimum of 50% of its thickness and is sufficiently resilient that after compression for about 5 seconds it returns to at least 70% of its original thickness.

16. (Currently amended) The composite of claim 12, wherein the fibrous batting is sufficiently lofty that it retains at least 50% of its thickness after addition of the gel forming liquid to form said aerogel monolith ~~15, wherein the batting is compressible by at least 65% of its thickness and is sufficiently resilient that after compression for about 5 seconds it returns to at least 75% of its original thickness~~.

17. (Original) The composite of claim 12, wherein the batting has a density in the range of about 0.1 to 16 lbs/ft^3 (0.001-0.4 g/cc), is compressible by at least 65% of its thickness and is sufficiently resilient that after compression for about 5 seconds it returns to at least 75% of its original thickness.

18. (Original) The composite of claim 12, wherein the batting has a density of about 2.44 to 6.1 lbs/ft^3 (0.04 to 0.1 g/cc).

19. (Currently amended) An aerogel monolith composite article comprising an aerogel monolith and a reinforcing structure to serve as a flexible, durable, light-weight insulation product wherein the reinforcing structure comprises (i) a lofty fibrous batting which causes no substantial ~~degrada-tion~~ degradation of the thermal performance of the aerogel as compared with a non-reinforced aerogel body of the same material and (ii) microfibers having

diameters from about 0.1 to 100 μm and aspect ratios greater than 5 ~~and (iii) the aerogel monolith is not formed by joining together of aerogel particles or granules in a binder~~.

20. (Original) The composite of claim 19, wherein the microfibers are comprised of a material having a thermal conductivity below about 200 mW/mK.

21. (Original) The composite of claim 19, wherein the microfibers are comprised of a material that resists sintering more than the lofty fibrous batting.

22. (Original) The composite of claim 19, wherein the microfibers are comprised of a material that reduces the transmission of infrared radiation through the composite more than the lofty fibrous batting.

23. (Original) The composite of claim 19, wherein the microfibers are comprised of a material that attenuates radio frequency waves.

24. (Original) The composite of claim 19, wherein the microfibers are comprised of one or more materials that attenuate electromagnetic waves.

25. (Original) The composite of claim 19, wherein the microfibers are selected from the group consisting of carbon fibers and copper fibers.

26. (Original) The composite of claim 19, wherein at least one of the following properties varies within spatial locations of the composite: microfiber material; microfiber size; microfiber aspect ratio; and microfiber quantity.

27. (Original) The composite of claim 19, wherein a material having a high thermal conductivity equal to or greater than 1 W/mK is added on the x-y axis of the composite structure in addition to the lofty batting.

28. (Original) The composite of claim 27, wherein the high thermal conductivity material comprises a metal.

29. (Original) The composite of claim 28, wherein the high thermal conductivity material is a metal which is sufficiently malleable to provide conformability to the composite to enable the composite to retain its shape after bending.

30. (Original) The composite of claim 29, wherein the metal is selected from the group consisting of copper and steel.

31. (Original) The composite of claim 27, wherein the high thermal conductivity material is in a porous form selected from the group consisting of mesh, sheet, perforated sheet, foil, and perforated foil.

32. (Original) The composite of claim 27, wherein the composite has an x-y horizontal plane and a z vertical plane and the thermally conductive materials are oriented in the x-y plane of the composite.

33. (Original) The composite of claim 27, wherein the high thermal conductivity material conducts heat away from a localized heat load and emits it to the environment.

34. (Currently amended) The composite of claim 33 ~~in combination with~~ further comprising a heat sink, wherein the heat is emitted to the environment by means of the heat sink.

35. (Original) The composite of claim 27, wherein the high thermal conductivity material conducts heat away from a localized heat load to a process which uses the thermal energy directly.

36. (Currently amended) The composite of claim 27 ~~in combination with~~ further comprising device which converts the thermal energy to electrical energy, wherein the high thermal conductivity material conducts heat away from a localized heat load and into the device.

37. (Original) The composite of claim 27, wherein the high thermal conductivity material comprises carbon fibers.

38. (Currently amended) An aerogel monolith composite article comprising an aerogel monolith and a reinforcing structure to serve as a flexible, durable, light-weight insulation product wherein the reinforcing structure comprises (i) a lofty fibrous batting which causes no substantial degradation of the thermal performance of the aerogel as compared with a non-reinforced aerogel body of the same material and (ii) one or more high thermal conductivity materials having a thermal conductivity of equal to or greater than 1 W/mK, ~~and (iii) the aerogel monolith is not formed by joining together of aerogel particles or granules in a binder~~.

39. (Original) The composite of claim 38, wherein the high thermal conductivity material comprises a metal.

40. (Original) The composite of claim 38, wherein the high thermal conductivity material is a metal which is sufficiently malleable to provide conformability to the composite to enable the composite to retain its shape after bending.

41. (Original) The composite of claim 40, wherein the metal is selected from the group consisting of copper and steel.

42. (Original) The composite of claim 38, wherein the high thermal conductivity material is in a porous form selected from the group consisting of mesh, sheet, perforated sheet, foil, and perforated foil.

43. (Original) The composite of claim 38, wherein the composite has an x-y horizontal plane and a z vertical plane and the high thermal conductivity material is oriented in the x-y plane of the composite.

44. (Currently amended) The composite of claim 38, wherein the high thermal conductivity material conducts heat away from a localized heat load and emits it to the ~~environ-ment~~ environment.

45. (Currently amended) The composite of claim 44, wherein the heat is emitted to the ~~environ-ment~~ environment by means of a heat sink.

46. (Original) The composite of claim 38, wherein the high thermal conductivity material conducts heat away from a localized heat load to a process which uses the thermal energy directly.

47. (Original) The composite of claim 38, wherein the high thermal conductivity material conducts heat away from a localized heat load and into a device which converts the thermal energy to electrical energy.

48. (Original) The composite of claim 38, wherein the high thermal conductivity material comprises carbon fibers.